NorthWest Arkansas Community College
Division of Science & Mathematics

Chem 1075 Fundamentals of Chemistry

Catalog Description: Fundamental principles of chemistry for students majoring in home economics, animal science, and other agricultural-related disciplines and students in health professions. Includes 4 hours lecture, 1 hour drill and 2 hours of laboratory per week

Prerequisites: Intermediate Algebra (MATH 0103), higher math, or minimum placement score for College Algebra

Credit hours/ Contact hours/ Load hours: 5/ 7/ 6

Target Audience/Transferability: This course is required by some programs in agriculture colleges but may be accepted as a general education science requirement for non-science programs as well. This course is also appropriate for students who are majoring in a nursing or allied health fields. However, it is the responsibility of the transfer institution and specific department to confirm transferability of this course.

Student Learning Outcomes: Students completing this course will:

- Utilize unit analysis and significant figure rules to solve problems and manipulate data.
- Write correct names and formulas for chemical substances, balance chemical equations and calculate quantities of chemicals involved utilizing stoichiometry.
- Identify types of chemical reactions and visible evidences of chemical reactions.
- Interpret macroscopic observations from a microscopic particle perspective and apply to:
  a. Solids, liquids and gases at changing temperatures.
  b. Gas laws and the behavior of gases.
  c. Aqueous chemical reactions.
- Utilize periodic properties of atoms to predict bonding (ionic, polar covalent, and nonpolar covalent) in compounds, draw Lewis Structures and predict geometric shapes of molecular compounds.
- Demonstrate ability to prepare, follow instructions, perform laboratory techniques and utilize measuring devices to collect, interpret, and manipulate experimental data.

Required Texts:

- Corwin, Introductory Chemistry, 6th edition, 2011

Required Equipment: Nonprogrammable scientific calculator

Topics:

- Scientific Measurements
- The Metric System
- Matter and Energy
- Models of the Atom
- The Periodic Table
- Language of Chemistry
- Chemical Reactions

- The Mole Concept
- Stoichiometry
- The Gaseous State
- Chemical Bonding
- Liquids and Solids
- Solutions
- Acids and Bases
- Oxidation and Reduction
- Nuclear Chemistry
- Optional Topic (Selected from below)

Optional Topics:
- Chemical Equilibrium
- Organic Chemistry
- Biochemistry

Requires Instructional Activities: This course includes a required laboratory component.
- **Sample Laboratory Experiments**
    - Safety in the Laboratory (Video, Quiz, Lecture)
    - Properties and Changes in Matter
    - Densities of Liquids and Solids
    - Simplest Formula of a Compound
    - Chemical Names and Formulas
    - Types of Chemical Reactions
    - Separation of Cations by Paper Chromatography
    - Mole Ratio for a Chemical Reaction
    - Molecular Models
    - Acids, Bases and pH
    - Preparation of Aspirin

Forms of Assessment: None